In the Claims:

1. (Currently Amended) A gear stage detection device comprising:

output shaft side pulse generating means ~~(21)~~ for generating a pulse in a number which corresponds to a rotary phase of an output shaft ~~(9)~~ of a transmission (T/M);

input shaft side pulse generating means ~~(22)~~ for generating a pulse in a number which corresponds to a rotary phase of an input shaft ~~(8)~~ of said transmission (T/M); and

gear stage determining means ~~(16)~~ for determining the current gear stage by inputting the output shaft side pulse and input shaft side pulse generated respectively by said pulse generating means ~~(21, 22)~~, counting a number of one pulse when a unitary number of the other pulse has been reached, and comparing the counted number of the one pulse with the unitary number of the other pulse which is predetermined for each gear stage of said transmission (T/M).

2. (Original) The gear stage detection device according to claim 1, wherein said one pulse is said input shaft side pulse and said other pulse is said output shaft side pulse.

3. (Currently Amended) A gear stage detection device comprising:

a vehicle speed sensor ~~(21)~~ for generating a vehicle speed pulse in a number which corresponds to a rotary phase of an output shaft ~~(9)~~ of a transmission (T/M), said sensor ~~(21)~~ being rotationally driven by said output shaft ~~(9)~~ via a meter gear ~~(32)~~;

a transmission rotation sensor ~~(20)~~ for generating a transmission pulse in a number which corresponds to a rotary phase of an input shaft ~~(8)~~ of said transmission (T/M); and

gear stage determining means ~~(16)~~ which input said vehicle speed pulse and transmission pulse respectively, store in advance a gear ratio of each gear stage of said transmission (T/M), a gear ratio of said meter gear ~~(32)~~, and a number of teeth of an input main gear ~~(11)~~ of said transmission (T/M), count the

number of transmission pulses generated by said transmission rotation sensor ~~(22)~~ during the generation of a predetermined unitary number of vehicle speed pulses by said vehicle speed sensor ~~(21)~~, and determine the current gear stage on the basis of at least the counted transmission pulse number, and the pre-stored gear ratio of each gear stage, gear ratio of said meter gear ~~(32)~~, and number of teeth of said input main gear ~~(11)~~.

4. (Currently Amended) The gear stage detection device according to claim 3, wherein said unitary number is the number of pulses generated during one revolution of said vehicle speed sensor ~~(21)~~, and

said gear stage determining means ~~(16)~~ insert said counted transmission pulse number and successively insert the gear ratio of each gear stage into the following equation

1 × (gear ratio of meter gear) × (gear ratio of each gear stage) × (number of teeth of input main gear) = (counted transmission pulse number)

such that the resultant gear stage upon the substantial establishment of said equation is determined to be the current gear stage.

5. (Currently Amended) The gear stage detection device according to claim 3, wherein said gear stage determining means ~~(16)~~ input said vehicle speed pulse via a pulse matching unit ~~(35)~~, said pulse matching unit ~~(35)~~ being a device for adjusting the time interval of the vehicle speed pulse inputted therein from said vehicle speed sensor ~~(21)~~ using a predetermined correction coefficient and then outputting said pulse to said gear stage determining means ~~(16)~~, such that the current gear stage is also determined on the basis of said correction coefficient.

6. (Currently Amended) A gear stage detection device comprising:

a vehicle speed sensor ~~(21)~~ for generating a vehicle speed pulse in a number which corresponds to a rotary phase of an output shaft ~~(9)~~ of a transmission (T/M), said sensor ~~(21)~~ being rotationally driven by said output shaft ~~(9)~~ via a meter gear ~~(32)~~;

a transmission rotation sensor ~~(20)~~ for generating a transmission pulse in a number which corresponds to a rotary phase of an input shaft ~~(8)~~ of said transmission (T/M); and

gear stage determining means which input said vehicle speed pulse and transmission pulse respectively, store in advance the gear ratio of each gear stage of said transmission (T/M) and a predetermined value obtained by multiplying the number of teeth of an input main gear ~~(11)~~ of said transmission (T/M) by the gear ratio of said meter gear ~~(32)~~, count the number of transmission pulses generated by said transmission rotation sensor ~~(20)~~ during the generation of a predetermined unitary number of vehicle speed pulses by said vehicle speed sensor ~~(21)~~, and determine the current gear stage on the basis of at least the counted transmission pulse number, the gear ratio of each gear stage, and said predetermined value.

7. (Currently Amended) The gear stage detection device according to claim 6, wherein said unitary number is the number of pulses generated during one revolution of said vehicle speed sensor ~~(21)~~, and

said gear stage determining means ~~(16)~~ insert said counted transmission pulse number and successively insert the gear ratio of each gear stage into the following equation

(predetermined value) = (counted transmission pulse number) / (gear ratio of each gear stage)

such that the resultant gear stage upon the substantial establishment of said equation is determined to be the current gear stage.

8. (Currently Amended) The gear stage detection device according to claim 6, wherein said unitary number is the number of pulses generated during one revolution of said vehicle speed sensor ~~(21)~~, and

said gear stage determining means ~~(16)~~ compare a value obtained by dividing said counted transmission pulse number by said predetermined value to the gear ratio of each gear stage and determine a gear stage having a gear ratio which substantially matches said value to be the current gear stage.

9. (Currently Amended) The gear stage detection device according to claim 6, wherein said gear stage determining means ~~(16)~~ input said vehicle speed pulse via a pulse matching unit ~~(35)~~, said pulse matching unit ~~(35)~~ being a device for adjusting the time interval of the vehicle speed pulse inputted therein from said vehicle speed sensor ~~(21)~~ using a predetermined correction coefficient and then outputting said pulse to said gear stage determining means ~~(16)~~, such that the current gear stage is also determined on the basis of said correction coefficient.

10. (Currently Amended) A gear stage detection method for detecting a current gear stage by generating a pulse in a number which corresponds to a rotary phase of an output shaft ~~(9)~~ of a transmission (T/M), generating a pulse in a number which corresponds to a rotary phase of an input shaft ~~(8)~~ of said transmission (T/M), counting a number of one of said pulses when a unitary number of the other pulse has been reached, and comparing the counted number of the one pulse with the unitary number of the other pulse which is predetermined for each gear stage of said transmission (T/M).

11. (Currently Amended) A gear stage detection device comprising:

a vehicle speed sensor ~~(21)~~ for generating a pulse in a number which corresponds to a rotary phase of an output shaft ~~(9)~~ of a transmission (T/M), said sensor ~~(21)~~ being rotationally driven by said output shaft ~~(9)~~ via a meter gear ~~(32)~~;

a transmission rotation sensor ~~(20)~~ for generating a pulse in a number which corresponds to a rotary phase of an input shaft ~~(8)~~ of said transmission (T/M); and

gear stage determining means ~~(16)~~ which input the pulses respectively generated by said sensors ~~(21, 20)~~, count a number of one pulse when a unitary number of the other pulse has been reached, and determine the current gear stage from the counted one pulse number,

wherein data regarding the counted value of said one pulse number based on the gear ratio of each gear stage of said transmission (T/M) and a plurality of gear ratios of the meter gear ~~(32)~~ are stored as a map in advance in said gear stage determining means ~~(16)~~, a gear ratio of the meter gear

~~(32)~~ installed in the transmission (T/M) is specified from said map, and the current gear stage is determined from the map of said counted value data which corresponds to said specified meter gear ratio.

12. (Currently Amended) The gear stage detection device according to claim 11, wherein the number of transmission pulses generated by said transmission rotation sensor ~~(20)~~ upon the generation of the unitary number of pulses by said vehicle speed sensor ~~(21)~~ is stored in said map for each gear stage of said transmission (T/M), and this transmission pulse number is stored therein for each of a plurality of values (Nd) obtained by dividing the transmission pulse number by the transmission gear ratio in accordance with the gear ratio of said meter gear ~~(32)~~.

13. (Currently Amended) The gear stage detection device according to claim 12, wherein the value of Nd is determined by dividing the transmission pulse number inputted from said transmission rotation sensor ~~(20)~~ by the gear ratio of the current gear stage, the meter gear ratio is determined from the value of Nd, and the current gear stage is determined from the map which corresponds to the determined meter gear ratio.

14. (Currently Amended) The gear stage detection device according to claim 13, wherein a pulse matching unit ~~(35)~~ for correcting the signal of said vehicle speed sensor ~~(21)~~ on the basis of differences in tire radius of movement, final gear ratio, and so on, is connected between said vehicle speed sensor ~~(21)~~ and said gear stage determining means ~~(16)~~, and

the signal of said vehicle speed sensor corrected by said pulse matching unit ~~(35)~~ and a correction coefficient (α) are inputted into said gear stage determining means ~~(16)~~, whereby the meter gear ratio and current gear stage are determined from a map by multiplying said correction coefficient (α) by the transmission pulse number.

15. (Original) The gear stage detection device according to claim 13, wherein transmission pulse number data for a plurality of types of transmission (T/M) in which the gear ratios of the transmission (T/M) differ at predetermined stages and match at the other stages are stored in said map, the meter gear ratio is determined when the transmission (T/M) is in the other gear stages, the type of transmission (T/M) is then determined from the transmission pulse number at the predetermined stages, and the current gear stage is determined using the map of the determined type.

16. (Currently Amended) The gear stage detection device according to claim 11, wherein, following the determination of the meter gear ratio using said map, said gear stage determining means ~~(16)~~ raise a flag indicating that the map based on the meter gear ratio has been learned, and a judgment as to a breakdown of a gear position sensor ~~(24)~~ is performed only when the flag is raised.